

REMARKS

Claims 1 - 26 are now pending in the application. Claims 1 and 14 are now amended. The claim amendments are fully supported by the application as filed and do not present new subject matter. The Examiner is respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

TELEPHONIC INTERVIEW

Applicant's representative, Brent G. Seitz, thanks Examiner Mruk for the courtesies extended during the telephonic interview of November 20, 2006. During the interview, differences between the invention and the cited art were discussed. No agreements were reached.

REJECTION UNDER 35 U.S.C. § 103

Claims 1 – 7, and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Toye (U.S. Pat. No. 4,068,144) in view of Arakawa et al. (U.S. Pat. No. 6,270,180 B1), and in further view of Hertz et al. (U.S. Pat. No. 4,050,075).

Claims 8 – 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Toye reference in view of the Arakawa et al. reference, and further in view of Speakman (U.S. Pat. No. 6,503,831 B2).

Claims 14 – 20 and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Toye reference in view of the Arakawa et al. reference and in further view of the Hertz et al. reference.

Claims 21 – 25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Toye reference in view of the Arakawa et al. reference and further in view of the Speakman reference.

These rejections are respectfully traversed.

Amended Claim 1 recites, with reference to Figure 4 for exemplary purposes only as the invention includes numerous embodiments, the following features: “a single waveform generating section [8b] that generates both the normal drive signal and the heating drive signal based on data generated by an arithmetic control section [8a], transition between generation of the normal drive signal and generation of the heating drive signal is a switchless operation;” “a switching circuit [33b] in receipt of at least one of the normal drive signal and the heating drive signal;” and “a switching signal generator [33a] in receipt of selection data generated by the arithmetic control section, the selection data designates one of the normal drive signal and the heating drive signal to be applied to the piezoelectric element.”

Amended Claim 14 discloses a method corresponding to the apparatus of Claim 1. Amended Claim 14 recites, for example, “generating both the normal drive signal and the heating drive signal using a single waveform generating section based on inputs received from an arithmetic control section, transition between generation of the normal drive signal and generation of the heating drive signal is a switchless operation.”

As set forth in the application as filed at paragraphs 57-59, “the drive signal generating section 8b generates various drive signals of predetermined shapes, namely the normal drive signal and the heating drive signal.” “[T]he arithmetic control section 8a generates selection data b according to the control programs and outputs the generated selection data b to the switching signal generator 33a. The selection data b is formed of ... waveform selection data for designating the drive signal [normal drive or

heating drive signal] to be applied to the piezoelectric element 30.” “... the arithmetic control section 8a instructs the switching signal generator 33a to select either the normal drive signal or the heating drive signal on the basis of the temperature detection signal c.”

Thus, as set forth in the description and as claimed, the drive signal generating section generates both the normal drive signal and the heating drive signal through a switchless operation. While Applicant does make use of a switching signal generator, the switching signal generator, via the switching circuit, simply selects which of the previously generated normal drive signal and the heating drive signal, which are both generated by the same drive signal generating section, are directed to the piezoelectric elements. The presence of a single drive signal generating section that generates both the normal and heating drive signals eliminates the need for separate signal generating sections connected by a switch, as the Arakawa et al. reference requires, to simplify the circuitry of the device.

The Office Action admits that the Toye reference fails to disclose, or alone suggest, the above recited features of amended Claims 1 and 14.

The Hertz et al. reference appears to disclose an ink jet method and apparatus capable of movement in both the X axis and the Y axis. The Hertz et al. reference fails to disclose or alone suggest the above recited features of amended Claims 1 and 14.

The Arakawa et al. reference appears to disclose, with reference to Figures 2 and 7, an ink jet printer having a drive-waveform generating circuit 15. The drive-waveform generating circuit 15 has a heat-waveform generating section 151 and a drive wave-form generating section 152. The heat-waveform generating section and the

drive-waveform generating section 152 are separate, even though they appear to be part of the overall drive-waveform generating circuit 15. To transition between **generating** a heat waveform generated by section 151 and a normal drive waveform generated by section 152, a “switching operation” must be performed, which includes actuation of the switch SW153. As set forth in the background section of Applicant’s invention, having the heat waveform generating section 151 and the drive-waveform generating section 152 separate “result[s] in a complicated circuit configuration,” which is undesirable.

The Arakawa et al. reference fails to disclose or alone suggest “a **single** waveform generating section that generates both the normal drive signal and the heating drive signal based on data generated by an arithmetic control section, transition between **generation** of the normal drive signal and **generation** of the heating drive signal is a **switchless** operation,” as set forth in Claim 1. The Arakawa et al. reference further fails to disclose or alone suggest, “generating both the normal drive signal and the heating drive signal using a single waveform generating section based on inputs received from an arithmetic control section, transition between generation of the normal drive signal and generation of the heating drive signal is a **switchless** operation, as set forth in Claim 14. **While Applicant does employ a “switching signal generator” and a “switching circuit,” these features simply select the previously generated normal drive signal or heating drive signal for transmission to the piezoelectric element. The switching signal generator and the switching circuit are not involved in the actual generation of the normal drive signal and the heating drive**

signal by the drive signal generating section 8b, as the switch SW153 of Arakawa et al. is.

As set forth above, the Toye, Arakawa et al., and the Hertz et al. references each fail to disclose or suggest each and every feature of amended Claims 1 and 14. Therefore, combination of the references fails to render obvious amended Claims 1 and 14, as well as those claims dependent therefrom, obvious. Applicant respectfully requests reconsideration and withdrawal of this Section 103 rejection.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action and the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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By:


G. Gregory Schimley, Reg. No. 27,382
Bryant E. Wade, Reg. No. 40,344

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600
GGS/BGS/cn